1.5/12e/ecka

Re-run

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6/24/03



RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/689,992A

DATE: 06/23/2003 TIME: 16:03:44

Input Set: N:\paola\US09689992A.raw.txt
Output Set: N:\CRF4\06232003\I689992A.raw

1 <110> APPLICANT: Mello, Craig C. Tabara, Hiroaki 3 Grishok, Alla Fire, Andrew 5 <120> TITLE OF INVENTION: RNA INTERFERENCE PATHWAY GENES AS TOOLS FOR TARGETED GENETIC INTERFERENCE 7 <130> FILE REFERENCE: UMG-052 C--> 8 <140> CURRENT APPLICATION NUMBER: US/09/689,992A 9 <141> CURRENT FILING DATE: 2000-10-13 10 <150> PRIOR APPLICATION NUMBER: US 60/193,218 11 <151> PRIOR FILING DATE: 2000-03-30 ENTERED 12 <150> PRIOR APPLICATION NUMBER: US 60/159,776 13 <151> PRIOR FILING DATE: 1999-10-15 14 <160> NUMBER OF SEQ ID NOS: 14 15 <170> SOFTWARE: FastSEQ for Windows Version 4.0 17 <210> SEQ ID NO: 1 18 <211> LENGTH: 3719 19 <212> TYPE: DNA 20 <213> ORGANISM: Caenorhabditis elegans 21 <400> SEQUENCE: 1 cagccacaaa gtgatgaaac atgtcctcga attttcccga attggaaaaa ggattttatc 60 23 gtcattctct cgatccggta tgatcaatta ttagcagcta taagatatat aagtttgata 120 24 ttaatattat aggagatgaa atggettgeg aggeecactg gtaaatgega eggeaaatte 180 25 tatgagaaga aagtacttct tttggtaaat tggttcaagt tctccagcaa aatttacgat 240 26 cgggaatact acgagtatga agtgaaaatg acaaaggaag tattgaatag aaaaccagga 300 27 aaacctttcc caaaaaagac agaaattcca atgtaagtgc ttgtaaatta gtcaaaacta 360 28 attttatttt tcagtcccga tcgtgcaaaa ctcttctggc aacatcttcg gcatgagaag 420 29 aagcagacag attttattct cgaagactat gtttttgatg aaaaggacac tgtttatagt 480 30 gtttgtcgac tgaacactgt cacatcaaaa atgctggttt cggagaaagt agtaaaaaag 540 31 gattcggaga aaaaagatga aaaggatttg gagaaaaaaa tcttatacac aatgatactt 600 32 acctatcqta aaaaatttca cctqaacttt aqtcqaqaaa atccqqaaaa aqacqaaqaa 660 gcgaatcgga gttacaaatt cctgaaggtt tatgaaaaac acgcattata acaaacaaaa 33 720 34 ttagetttca gaatgttatg acceagaaag ttegetaege geettttgtg aacgaggaga 780 35 ttaaagtgtg agttgcaata ataataataa taatcacctc aactcattta tatattttaa 840 36 gacaattcgc gaaaaatttt gtgtacgata ataattcaat tctgcgagtt cctgaatcgt 900 37 ttcacgatcc aaacagattc gaacaatcat tagaagtagc accaagaatc gaagcatggt 960 38 1020 ttggaattta cattggaatc aaagaattgt tcgatggtga acctgtgctc aattttgcaa 39 gtaagtttga gaaactgcga taaaaaatca tgtgattttt gttgaagttg tcgataaact 1080 40 attotacaat gcaccgaaaa tgtctcttct ggattatctt ctcctaattg tcgaccccca 41 gtcgtgtaac gatgatgtac gaaaagatct taaaacaaaa ctgatggcgg gaaaaatgac 1200 42 aatcagacaa gccgcgcgc caagaattcg acaattattg gaaaatttga agctgaaatg 1260 43 cgcagaagtt tgggataacg aaatgttagt ttaaattatt caaacaatta atatacaaat 1320

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44

PATENT APPLICATION: US/09/689,992A TIME: 16:03:44

DATE: 06/23/2003

Input Set : N:\paola\US09689992A.raw.txt
Output Set: N:\CRF4\06232003\I689992A.raw

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94
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Input Set : N:\paola\US09689992A.raw.txt Output Set: N:\CRF4\06232003\I689992A.raw

| 95 | | | | | | | 1 | | | | 5 | | | | 1 | .0 | |
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| 96 | ttt | tat | cqt | cat | tct | ctc | gat | ccq | gag | atq | aaa | tga | ctt | gcg | agg | ccc | 101 |
| 97 | | | | | | | | | | | | | | Ālā | | | |
| 98 | | - | _ | 15 | | | • | | 20 | | - | - | | 25 | _ | | |
| 99 | act | ggt | aaa | tgc | gac | ggc | aaa | ttc | tat | gag | aag | aaa | gta | ctt | ctt | ttg | 149 |
| 100 | | | | | | | | | | | | | | | | Leu | |
| 101 | | _ | 30 | | - | - | - | 35 | | | _ | - | 40 | | | | |
| 102 | gta | aat | tgg | tto | aag | ttc | tcc | ago | aaa | att | tac | gat | cqc | gaa | tac | tac | 197 |
| 103 | | | | | | | | | | | | | | | | Tyr | |
| 104 | | 45 | _ | | - | | 50 | | - | | - | 55 | _ | , | - | - | |
| 105 | gag | tat | gaa | gtg | aaa | atg | aca | aac | gaa | qta | ttq | aat | aga | aaa | cca | gga | . 245 |
| 106 | | | | | | | | | | | | | | | | Ğĺy | |
| 107 | 60 | _ | | | - | 65 | | - | | | 70 | | _ | _ | | 75 | |
| 108 | aaa | cct | ttc | cca | aaa | aaq | aca | gaa | att | cca | att | ccc | gat | cat | gca | aaa | 293 |
| 109 | | | | | | _ | | - | | | | | _ | _ | _ | Lys | |
| 110 | - | | | | 80 | - | | | | 85 | | | • | _ | 90 | _ | |
| 111 | ctc | ttc | : tgg | caa | cat | ctt | cqq | cat | gad | aac | aaq | caq | aca | gat | ttt | att | 341 |
| 112 | | | | | | | | | | | | | | | | Ile | |
| 113 | | | - | 95 | | | _ | | 100 | _ | - | | | 105 | | | |
| 114 | ctc | gaa | gac | tat | gtt | ttt | gat | gaa | aac | gac | act | qtt | tat | agt | att | tgt | 389 |
| 115 | | | | | | | | | | | | | | | | Cys | |
| 116 | | | 110 | | | | - | 115 | | • | | | 120 | | | - | |
| 117 | cga | ctg | aac | act | gtc | aca | tca | aaa | ato | ctq | gtt | tcg | gao | aaa | gta | gta | 437 |
| 118 | | | | | | | | | | | | | | Lys | | | |
| 119 | _ | 125 | ı | | | | 130 | _ | | | | 135 | | - | | | |
| 120 | aaa | aag | gat | tcg | gag | aaa | aaa | gat | gaa | aag | gat | ttg | gag | aaa | aaa | atc | 485 |
| 121 | | | | | | | | | | | | | | | | Ile | |
| 122 | 140 | | | | | 145 | | | | _ | 150 | | | _ | _ | 155 | |
| 123 | tta | tac | aca | atg | ata | ctt | acc | tat | cgt | aaa | aaa | ttt | cac | ctg | aac | ttt | 533 |
| 124 | Leu | Tyr | Thr | Met | Ile | Leu | Thr | Tyr | Arg | Lys | Lys | Phe | His | Leu | Asn | Phe | |
| 125 | | | | | 160 | | | | | 165 | , | | | | 170 | | |
| 126 | agt | cga | gaa | aat | ccg | gaa | aaa | gac | gaa | gaa | gcg | aat | cgg | agt | tac | aaa | 581 |
| 127 | Ser | Arg | Glu | Asn | Pro | Glu | Lys | Asp | Glu | Glu | Ala | Asn | Arg | Ser | Tyr | Lys | |
| 128 | | | | 175 | | | | | 180 | l | | | | 185 | | | |
| 129 | ttc | ctg | aag | aat | gtt | atg | acc | cag | aaa | gtt | cgc | tac | gcg | cct | ttt | gtg | 629 |
| 130 | Phe | Leu | Lys | Asn | Val | Met | Thr | Gln | Lys | Val | Arg | Tyr | Ala | Pro | Phe | Val | |
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| 132 | aac | gag | gag | att | aaa | gta | caa | ttc | gcg | aaa | aat | ttt | gtg | tac | gat | aat | 677 |
| 133 | Asn | | | Ile | Lys | Val | Gln | Phe | Ala | Lys | Asn | Phe | Val | Tyr | Asp | Asn | |
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| 135 | | | | | | | | | | | | | | aac | | | 725 |
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PATENT APPLICATION: US/09/689,992A TIME: 16:03:44

DATE: 06/23/2003

Input Set : N:\paola\US09689992A.raw.txt
Output Set: N:\CRF4\06232003\I689992A.raw

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| 145 | Ala | He | | Asp | Lys | Leu | Phe | - | Asn | Ala | Pro | Lys | | Ser | Leu | Leu | |
| 146 | | | 270 | | | | | 275 | | | | | 280 | | | | |
| 147 | | | | | | att | | | | | | | | | | | 917 |
| 148 | Asp | _ | Leu | Leu | Leu | Ile | | Asp | Pro | Gln | Ser | _ | Asn | Asp | Asp | Val | |
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| 150 | | | | | | aca | | | | | | | | | | | 965 |
| 151 | | Lys | Asp | Leu | Lys | Thr | Lys | Leu | Met | Ala | _ | Lys | Met | Thr | Ile | _ | |
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| 153 | | | | | | aga | | - | | | _ | _ | | _ | _ | _ | 1013 |
| 154 | Gln | Ala | Ala | Arg | | Arg | Ile | Arg | Gln | | Leu | Glu | Asn | Leu | - | Leu | |
| 155 | | | | | 320 | | | | | 325 | | | | | 330 | | |
| 156 | | | | | | tgg | | | | | | | | | | | 1061 |
| 157 | Lys | Cys | Ala | | Val | Trp | Asp | Asn | | Met | Ser | Arg | Leu | | Glu | Arg | |
| 158 | | | | 335 | | | | | 340 | | | | | 345 | | | |
| 159 | | | | | | gat | | | | | | | | | | | 1109 |
| 160 | His | Leu | | Phe | Leu | Asp | Leu | _ | Glu | Glu | Asn | Ser | | Val | Tyr | Lys | |
| 161 | | | 350 | | | | | 355 | | | | | 360 | | | | |
| 162 | | | | | | gac | | | | | | | | | | | 1157 |
| 163 | Val | | Gly | Lys | Ser | Asp | _ | Gly | Arg | Asn | Ala | _ | Lys | Tyr | Asp | Thr | |
| 164 | | 365 | | | | | 370 | | | | | 375 | | | | | |
| 165 | | | | | | tat | | | | | | | | | | | 1205 |
| 166 | | Leu | Phe | Lys | He | Tyr | GLu | GLu | Asn | Lys | _ | Phe | Ile | Glu | Phe | | |
| 167 | 380 | | | | | 385 | | | | | 390 | | | | | 395 | |
| 168 | | | | | - | aaa | _ | | _ | | - | | _ | | _ | _ | 1253 |
| 169 | Hls | Leu | Pro | Leu | | Lys | Val | Lys | Ser | | Ala | Lys | Glu | Tyr | | Val | |
| 170 | | | | | 400 | | | | | 405 | | | | | 410 | | |
| 171 | | _ | _ | | | gaa | _ | | | _ | | | _ | | _ | | 1301 |
| 172 | Pro | мет | GLU | | ьeu | Glu | vaı | HIS | | ьуs | Pro | GIn | Arg | _ | ьуs | Asn | |
| 173 | | | | 415 | | | | | 420 | | | | | 425 | | | 1240 |
| 174 | | | | | - | atg | | - | _ | | | _ | _ | - | | _ | 1349 |
| 175 176 | Arg | тте | | ьeu | vaı | Met | GIN | _ | ьys | Pne | ьeu | гуѕ | | Ата | Thr | Arg | |
| 177 | | -a+ | 430 | ~~~ | + | | ~~~ | 435 | | | | | 440 | | | | 1207 |
| 178 | | | | | | aaa | | | | | | | | | | | 1397 |
| 179 | гу | 445 | птэ | Asp | тут | Lys | 450 | ASII | 1111 | ьeu | гуѕ | 455 | ьeu | пуѕ | Giu | ьeu | |
| 180 | ant- | | + a+ | + -+ | ~~~ | ~~~ | | + | +++ | ~++ | ~~~ | | | ~~~ | | +~~ | 1 / / E |
| 181 | _ | | | | - | gag | | | | _ | _ | _ | | | | - | 1445 |
| 182 | 460 | rne | ser | ser | GLU | Glu 465 | ьеu | ASII | Pile | Val | 470 | Arg | Pne | СТУ | ьеи | - | |
| 183 | | 222 | att | 020 | 2+4 | | ~~~ | + ~+ | | ~~~ | | ~++ | ++~ | 222 | ~~~ | 475 | 1402 |
| 184 | | | | | | atc | | | | | | | | | | | 1493 |
| 185 | ser | гу | ьeu | GIII | 480 | Ile | Gru | Cys | PLO | 485 | гуу | vai | ьeu | туу | 490 | PLO | |
| 186 | a+a | c++ | at a | 22+ | | at a | 22+ | a 22 | a aa | | 222 | 2+4 | 202 | 000 | | a++ | 15/1 |
| 187 | | | | | | gta Val | | | | | | | | | | | 1541 |
| 188 | Het | пеи | vaı | 495 | Ser | Val | ASII | Giu | 500 | 116 | пур | Met | 1111 | 505 | val | тте | |
| 189 | cat | aas | +++ | | (T 2 2 | aaa | C22 | ++~ | | ata | a++ | 000 | ~~~ | | ~~~ | att. | 1589 |
| 190 | | | | | | Lys | | | | | | | | | | | 1009 |
| 191 | ALG | оту | 510 | G T 11 | GIU | пуз | GTII | 515 | USII | vaı | val | ETO | 520 | пур | GIU | пеп | |
| 192 | tac | + ~+ | | at+ | +++ | gta | ata | | CT D D | 202 | aca | ~~~ | | 000 | tac | ++- | 1637 |
| 274 | cyc | cyc | get | guu | | yıa | gue | aac | yaa | aca | geg | yya | aaı | CCa | Lyc | cca | 1027 |

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Input Set : N:\paola\US09689992A.raw.txt Output Set: N:\CRF4\06232003\1689992A.raw

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| 195 196 | Glu | gag Glu | aac Asn | gac Asp | gtt Val | Val | aag Lys | ttc Phe | tac Tyr | acc Thr | Glu | Leu | att Ile | ggt Gly | ggt Gly | tgc Cys | 1685 |
| 197 198 | 540 | | ~~+ | ~~~ | | 545 | | | | | 550 | | | | | 555 | |
| 199 | aay Lus | ttc Phe | Ara | Gly | Tlo | Cga Ara | att | ggt | gcc | aat | gaa | aac | aga | gga | gcg | caa | 1733 |
| 200 | БуЗ | 1110 | my | OLY | 560 | Arg | 116 | G т у | Ата | 565 | Glu | ASII | Arg | GIY | 570 | GIN | |
| 201 | tct | att | atq | tac | | aca | acσ | aaa | aat | | tat | acc | ttc | tac | | aat | 1781 |
| 202 | Ser | Ile | Met | Tyr | Asp | Ala | Thr | Lvs | Asn | Glu | Tvr | Ala | Phe | Tvr | Lvs | Asn | 1701 |
| 203 | | | | 575 | • | | | 1 - | 580 | | -1- | | | 585 | 275 | 11011 | |
| 204 | tgt | aca | cta | aat | acc | gga | atc | ggt | aga | ttt | gaa | ata | gcc | gca | aca | gaa | 1829 |
| 205 | Cys | Thr | Leu | Asn | Thr | Gly | Ile | Gly | Arg | Phe | Ğlu | Ile | Ála | Ála | Thr | Ğlu | |
| 206 | | | 590 | | | | | 595 | | | | | 600 | | | | |
| 207 | gcg | aag | aat | atg | ttt | gaa | cgt | ctt | CCC | gat | aaa | gaa | caa | aaa | gtc | tta | 1877 |
| 208 209 | Ala | Lys 605 | Asn | Met | Phe | Glu | Arg 610 | Leu | Pro | Asp | Lys | Glu 615 | Gln | Lys | Val | Leu | |
| 210 | atg | ttc | att | atc | att | tcc | aaa | cga | caa | ctg | aat | gct | tac | ggt | ttt | gtg | 1925 |
| 211 | Met | Phe | Ile | Ile | Ile | | Lys | Arg | Gln | Leu | Asn | Ala | Tyr | Gly | Phe | Val | |
| 212 | 620 | | | | | 625 | | | | | 630 | | | | | 635 | |
| 213 | aaa | cat | tat | tgc | gat | cac | acc | atc | ggt | gta | gct | aat | cag | cat | att | act | 1973 |
| 214 215 | ьys | His | Tyr | Cys | 45p | Hls | Thr | lle | GLY | | Ala | Asn | Gln | His | | Thr | |
| 216 | tct | ma a | 202 | ata | | 222 | aat | ++~ | ~~~ | 645 | a+ a | | | | 650 | | 0001 |
| 217 | Ser | gaa Glu | Thr | Val | Thr | Tive | Δla | Leu | yca Nla | Sor | CLa | agg | cac | gag | aaa | gga | 2021 |
| 218 | 001 | 014 | | 655 | 1111 | цуз | пта | пец | 660 | Det | пеп | ALG | пта | 665 | гÃ2 | GTA | |
| 219 | tca | aaa | cga | | ttc | tat | caa | att | | tta | aaa | atc | aac | | aaa | tta | 2069 |
| 220 | Ser | Lys | Ārg | Ile | Phe | Tyr | Gln | Ile | Ala | Leu | Lvs | Ile | Asn | Ala | Lvs | Leu | 2005 |
| 221 | | | 670 | | | - | | 675 | | | _ | | 680 | | -1- | | |
| 222 | gga | ggt | att | aac | cag | gag | ctt | gac | tgg | tca | gaa | att | gca | gaa | ata | tca | 2117 |
| 223 | Gly | Gly | Ile | Asn | Gln | Glu | Leu | Asp | Trp | Ser | Glu | Ile | Āla | Ğlu | Ile | Ser | |
| 224 | | 685 | | • | | | 690 | | | | | 695 | | | | | |
| 225 | cca | gaa | gaa | aaa | gaa | aga | cgg | aaa - | aca | atg | cca | tta | act | atg | tat | gtt | 2165 |
| 226 227 | 700 | Glu | GIU | гÀг | Glu | | Arg | Lys | Thr | Met | | Leu | Thr | Met | Tyr | | |
| 228 | | 2++ | ant. | at a | 204 | 705 | 000 | | + | + | 710 | | | | | 715 | 0010 |
| 229 | Glv | att Ile | yaı Den | y La Val | Thr | Hie | Dro | Thr | CCC | Tur | agt | gga | att | gat | tat | tct | 2213 |
| 230 | OLY | 110 | Азр | vai | 720 | 1115 | FIO | 1111 | ser | 725 | ser | GIY | тте | Asp | 730 | ser | |
| 231 | ata | gcg | act | ata | | aca | agt | atc | aat | | aat | aas | act | 2+0 | | cas | 2261 |
| 232 | Ile | Ala | Ala | Val | Val | Ala | Ser | Ile | Asn | Pro | Glv | Glv | Thr | Tle | Tur | Δra | 2201 |
| 233 | | | | 735 | | | | | 740 | | O-1 | O±y | | 745 | - 4- | 711 9 | |
| 234 | aat | atg | att | gtg | act | caa | gaa | gaa | | cgt | ccc | aat | gag | | αca | ata | 2309 |
| 235 | Asn | Met | Ile | Val | Thr | Gln | Glu | Glu | Cys | Arg | Pro | ĞÎy | Ğlū | Arg | Āla | Val | |
| 236 | | | 750 | | | | | 755 | | | | | 760 | - | | | |
| 237 | gct | cat | gga | cgg | gaa | aga | aca | gat | att | ttg | gaa | gca | aag | ttc | gtg | aaa | 2357 |
| 238 | Ala | His | Gly | Arg | Glu | Arg | Thr | Asp | Ile | Leu | Glu | Ala | Lys | Phe | Val | Lys | |
| 239 | | 765 | | | | | 770 | | | | | 775 | | | | | |
| 240 | ttg | ctc | aga | gaa | ttc | gca | gaa | aac | aac | gac | aat | cga | gca | cca | gcg | cat | 2405 |
| 241 | ьeu | Leu | Arg | GLu | Phe | Ala | GLu | Asn | Asn | Asp | Asn | Arg | Ala | Pro | Ala | His | |

RAW SEQUENCE LISTING ERROR SUMMARY PATENT APPLICATION: US/09/689,992A

DATE: 06/23/2003 TIME: 16:03:45

Input Set : N:\paola\US09689992A.raw.txt
Output Set: N:\CRF4\06232003\I689992A.raw

Please Note:

Use of n and/or Xaa have been detected in the Sequence Listing. Please review the Sequence Listing to ensure that a corresponding explanation is presented in the <220> to <223> fields of each sequence which presents at least one n or Xaa.

Seq#:5; Xaa Pos. 386,400,402

Seq#:8; Xaa Pos. 2,3,4,6,8,9,10,12,13,14,15,16,17,18,19,21,22,23,24,25,26

Seq#:8; Xaa Pos. 29,31,32,33,35,36,37,39,40,41,43,44,45,46,47,49,51,55,56

Seq#:8; Xaa Pos. 59,60,63,64,67,68

Invalid Line Length:

The rules require that a line not exceed 72 characters in length. This includes spaces.

Seq#:1; Line(s) 5

VERIFICATION SUMMARY

PATENT APPLICATION: US/09/689,992A

DATE: 06/23/2003 TIME: 16:03:45

Input Set : N:\paola\US09689992A.raw.txt Output Set: N:\CRF4\06232003\1689992A.raw

L:8 M:270 C: Current Application Number differs, Wrong Format

L:509 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:5 after pos.:384

M:341 Repeated in SeqNo=5

L:719 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:8 after pos.:0

M:341 Repeated in SeqNo=8